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## ABSTRACT

This study examined the use of English in nursing education, training, and practice in Jordan. Participants were 152 nurses working in different hospitals, all of whom were native Arabic speakers. The nurses completed a six-part questionnaire that examined their age, sex, place of work, qualifications, years of experience, attitudes toward English, motivations to learn English, evaluation of English language instruction at school, perceptions of their own English abilities, and reactions to the use of English on and off the job. Results indicated that respondents considered English necessary for professional success. Nurses believed that the three main reasons to learn English were better job opportunities, further training, and updating their medical knowledge. They felt that English language instruction at school was very useful to them in their profession. They considered themselves better in reading than writing, listening comprehension, and speaking. Most of the nurses claimed they needed English on the job for understanding professional lectures and discussing medical cases with colleagues. Respondents mainly used English off the job to communicate with foreigners and follow television and radio programs. These nurses tended to have exaggerated beliefs about their abilities in English. The survey is appended. (SM)

# English in Medicine: The Case of English for the Nursing Profession

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**ABSTRACT.** The development of medical care in Jordan has necessitated more dependence on English both as a language of instruction in medical and allied health profession on one hand and as a language of communication in private and public medical facilities in the country on the other hand. The case of English language use in the area of medicine in Jordan typifies that in other Arab countries and many developing countries in the world. This paper reports the findings of a country wide field study investigating the following dimensions of the use of English in nursing education, training and practice.

1. A survey of nursing preparation programs and the role of English in instruction in nursing education and training.
2. An examination of the English curricula as to their focus on both general English and special English and to their response to the actual needs of the learner.
3. The extent of English language use on and off the job and the specific requirements of skills in English.
4. The student nurse as a learner of English as to his/her attitudes, motivation and perception of abilities and needs.

The paper ends with conclusions and implications.

## 1. INTRODUCTION

Medical care in its modern facilities, personnel, and administration is a relatively recent phenomenon in the Jordanian society. Prior to the 1950s, these services were scantily offered to Jordanians in a very limited number of poorly staffed and poorly equipped medical centers. But with the intensive movement of the modernization of the country starting in the early 1950s, more facilities were established and serious thinking into staffing them was given. At the general practitioners level of personnel, hundreds of Jordanians sought training in different countries in the world and mostly in the previous Eastern Block and started returning to fill out badly needed posts and at a later stage to queue in line unemployed (see Zughoul and Badarin 1989).

Opposite to the training of medical doctors which was carried out outside the country, the training of nurses has always been conducted in Jordan itself. For the purpose of this article, a general description of the status quo in nursing is probably more important than a historical descriptive study. Nursing education is carried out in Jordan at different stages of the

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educational system of the country. We will start from the bottom of the ladder and go up gradually (for more details on these levels see Sultan 1997).

## 1. Nursing education at the Secondary school level

Nursing education at the level of the preparation of assistant nurses programs were started by the Ministry of Education in collaboration with the Ministry of Health. From a few centers in a few locations, the number went up to 23 centers for training assistant nurses in 1987 to almost a center in every major secondary school in the country. In these centers, students spent two years receiving occasional nursing education. Assistant nurses were trained to receive patients, collect basic data on them, participate in preparing them for surgery, collect laboratory samples, get rid of medical wastes, assist legal nurses, watch over patients, and feed unable patients.

## 2. Colleges of Nursing

These colleges which are about 19 graduate both legal nurses and assistant nurses. Admission is based on having a secondary school certificate, and they are sponsored by the Ministry of Health. Sometimes, they are attached to major hospitals for training purposes. The program has two major well-balanced components: theoretical and practical. Since 1981, there has been a trend towards incorporating more English into the program. At a later stage, there was a movement toward Arabicization and keeping English as a first foreign language. Courses included first aid, nutrition, psychology, surgical/internal nursing, science, physics, and chemistry.

In line with these institutions sponsored by the Ministry of Health, the army has have its own schools for assistant nursing education. These offer seven major nursing specialties including general nursing, medical laboratories, mouth and teeth health services, pharmaceutical studies, x-rays, and cooperate nursing.

### **3. Three to four-year nursing colleges**

These are post secondary colleges for nursing and midwifery. These specialized colleges differ from the previous ones in that they require more credit hours which may go up to 141 credit hours. They employ more strict measures for admission, insist on using English as a medium of instruction, and provide wider coverage in training. The curriculum includes such wide topics as principles of nursing, child birth nursing, society nursing, psychological nursing, nutrition, hospital services, health education and administration. These are four known nursing colleges in the country.

### **4. Highest on the ladder is nursing education at the university level. Such programs lead to the B.A. and M.A. degrees in nursing. They are similar to any other degrees in nursing in English speaking countries. There are four such programs offered by four different universities in the country.**

As assistant nurses, legal nurses or staff nurses joining hospitals and medical centers face a dubious problem in the language of communication on the job. It is beyond the scope of this paper to describe the role of English versus Arabic as a language of communication in Jordan, but we can assert that English is firmly established in the medical profession in Jordan (for a description of the role of English in Jordan, see Harrison, Prator, and Tucker 1975, Zughoul and Badarin 1988, Zughoul and Hussein 1985, Zughoul and Hussein 1987, Zughoul 1999).

## **2. METHODOLOGY**

This paper presents the reactions of 152 Jordanian nurses to a questionnaire of six parts (see Appendix). This questionnaire was adapted from Zughoul and Badarin (1988). The first part of this questionnaire was designed to collect background information regarding the participants' age, sex, place of work, qualifications, and years of experience. The second part was intended to gather data about the nurses' reactions to six general attitudinal dimensions. The third part was designed to elicit responses to five motivational dimensions, whereas the fourth part was planned to elicit data regarding the subjects' evaluation of English language instruction at school. The fifth part of the questionnaire elicited data concerning the participants' perception of abilities, while the sixth part elicited the subjects' reactions to the use of English on and off the job.

The sample of this study consisted of 152 nurses working in the field in different hospitals. It comprised seventy-six female nurses and seventy-six male nurses who are native speakers of Arabic. Fifty-eight nurses aged 24 or less, fifty-four between 25 and 27, twenty-seven between 30 and 34, and thirteen aged 35 or over. The subjects work in either private or public health facility. Those who work in private hospitals are forty-six, whereas those who work in public hospitals are 106. About half the participants have up to three years of experience, while the others have six or more years of experience.

### 3. Findings and Discussion

The findings of this research will be discussed under the headings of general attitudes, motivation, English language instruction, perception of abilities, and language use.

#### 3.1. General Attitudes

Items 1 - 6 on the questionnaire were intended to explore the nurses' general attitudes to English.

Table I below is a summary of their reactions.

Table I

Summary of Responses to General Attitudes

	SD		D		N		A		SA	
	N	%	N	%	N	%	N	%	N	%
1. Knowledge of E. necessary for success	1	.7	3	2.0	3	2.0	54	35.5	91	59.9
2. Knowledge of E. improves professional standards.			3	2.0	9	5.9	56	36.8	84	55.3
3. E. to keep up with new developments in nursing					5	3.3	52	34.2	95	62.5
4. Feel proud speaking E.	7	4.6	27	17.8	38	25.0	48	31.6	32	21.1
5. Feel uncomfortable- don't know E. well	5	3.3	23	15.1	30	19.7	65	42.8	29	19.1
6. E. as prestige marker	16	10.5	47	30.9	39	25.7	38	25.0	12	7.9

An examination of the figures in Table I above shows that the subjects of this study believe that English is necessary for success in their profession as nurses. Responding to the first item on the questionnaire, the overwhelming majority (95.4%) of the respondents agreed that knowledge of English is necessary for success. The second item which states that knowledge of English improves professional standards received the agreement of 92.1% of the sample. When asked about keeping up with new developments, almost all the subjects (96.7%) agreed that knowledge of English enables them to keep up with new developments in the field of nursing. None of the participants disagreed on this issue, while only five of them responded neutral.

As for the fourth item which maintains that the nurse feels proud when he or she speaks English, the subjects are clearly divided in their responses. More than half the sample (52.7%) responded positively to this item, whereas 22.3% of the sample reacted negatively. Moreover 25% of the sample were neutral. The fifth item which specifies that the nurse feels uncomfortable because he or she doesn't know English well received the agreement of 61.9% of the sample. However, the item that received the least approval (32.9%) was the sixth item which states that knowledge

of English is a prestige marker. This item received the disapproval of 41.4% of the sample, the largest negative response of all the items in this part of the questionnaire. The smallest percentage (25.7%) of the sample was neutral.

### 3.2. Motivation

Items 7 - 11 on the questionnaire were designed to examine the nurses' views of the utility of English. Table II below summarizes the responses of the subjects.

Table II

Summary of Responses to Motivation

	N	<u>SD</u> %	N	<u>D</u> %	N	<u>N</u> %	N	<u>A</u> %	N	<u>SA</u> %
7. Job opportunities	2	1.3	18	11.8	28	18.4	63	41.4	41	27.0
8. Further training			2	1.3	5	3.3	52	34.2	93	61.2
9. Updates medical knowledge			7	4.6	11	7.2	65	42.8	69	45.4
10. E. helps but necessary	27	17.8	76	50.0	15	9.9	21	13.8	13	8.6
11. Trying seriously to improve my E.	1	.7	12	7.9	50	32.9	58	38.2	31	20.4

If we consider the figures in Table II, we find that the subjects are in general agreement on the three main purposes for learning English, namely for better job opportunities (item 7), further training (item 8), and updating medical knowledge (item 9) which received the agreement of 68.5%, 95.4%, and 88.2% respectively. However, item 10 which maintains that English helps the subject in his profession, but it is not necessary received the highest percentage of disapproval (67.8%). This clearly shows that our subjects perceive the importance of English in their profession. In their reaction to item 11 which states that the subject is trying seriously to

improve his English, more than half the participants (58.6%) responded positively, whereas 8.6% responded negatively, and 32.9% reacted neutral.

### 3.3. Evaluation of English Language Instruction

Section four of the questionnaire deals with the overall evaluation of English language instruction. Table III below is a summary of the responses of the sample to four questions which investigate the subjects' evaluation of the courses taken at school.

Table III

Summary of Responses to Evaluation of English Language Instruction

	<u>SD</u>		<u>D</u>		<u>N</u>		<u>A</u>		<u>SA</u>	
	N	%	N	%	N	%	N	%	N	%
12. Courses helped understand/use E.			6	3.9	10	6.6	78	51.3	58	38.2
13. Courses provided gen. L. knowledge			3	2.0	17	11.2	88	57.9	44	28.9
14. Courses helped in reading references	1	.7	5	3.3	19	12.5	69	45.4	58	38.2
15. Courses helped in written work	1	.7	5	3.3	17	11.2	73	48.0	56	36.8

An examination of Table III shows that the subjects of this study are in strong agreement on the four items regarding the evaluation of English language instruction. These four items, namely courses helped in understanding and using English (item 12), providing general language knowledge (item 13), reading references (item 14), and writing assignments (item 15) received the agreement of 89.5%, 86.8%, 83.6%, and 84.8%, respectively. These results clearly illustrate that the overwhelming majority of our respondents viewed English language instruction at school as very useful to them in their profession.

### 3.4. Perception of Language Abilities

Section five of the questionnaire explores the participants' perceptions of their own language abilities in English. Table IV presents a summary of the subjects' reactions to item 16 which examines the sample's own ranking of their abilities in the four language skills on a scale from "weak" to "very good".

Table IV

Perception of Language Abilities

16.		<u>Weak</u>	N	%		<u>Fair</u>	N	%		<u>Good</u>	N	%		<u>V. Good</u>	N	%		<u>No Resp.</u>	N	%
	Listening Compreh.	4	2.6		28	18.4	65	42.8		54	35.5		1	.7						
	Speaking	6	3.9		29	19.1	83	54.6		31	20.4		3	2.0						
	Reading	2	1.3		9	5.9	54	35.5		83	54.6		4	2.6						
	Writing	4	2.6		15	9.9	57	37.5		74	48.7		2	1.3						

An examination of the figures in Table IV above indicates that the respondents regarded themselves as best in reading than in writing, listening comprehension and last in speaking. However, there is some exaggeration in their assessment of their abilities in the four language skills. As for reading, 90.1% viewed themselves as "good" and "very good", while in writing 86.2% regarded themselves as "good" and "very good". Moreover, 78.3% of the sample judged themselves as "good" and "very good", whereas 75% judged themselves as "good" and "very good".

### 3.5. Language Use on the Job

Items 17 through 24 on the questionnaire investigate the participants' reactions to the use of English on the job. The results of these reactions are summarized in Table V below.

Table V

## Language Use on the Job

	<u>Never</u>		<u>Rarely</u>		<u>Sometimes</u>		<u>Always</u>		<u>No Resp.</u>	
	N	%	N	%	N	%	N	%	N	%
17. Listening to instructions	12	7.9	19	12.5	79	52.0	41	27.0	1	.7
18. Understanding prof. lectures	5	3.3	19	12.5	58	38.2	70	46.1		
19. Discussing medical cases	2.0	15	9.9	64	42.1	70	46.1			
20. Reading instructions	4	2.6	10	6.6	34	22.4	103	67.8	1	.7
21. Reading med. reports	4	2.6	3	2.0	22	14.5	123	80.9		
22. Reading patient file			5	3.3	21	13.8	124	81.6	2	1.3
23. Reading references	6	3.9	15	9.9	34	22.4	97	63.8		
24. Writing cor-respondence	28	18.4	31	20.4	39	25.7	51	33.6	3	2.0

If we examine the responses to item 17 and 18, we find that in the skill of listening the nurses need English most for understanding professional lectures. An overwhelming majority (84.3%) of the participants claimed that they "sometimes" 38.2% and "always" 46.1% use English to understand professional lectures. It is true that these lectures are usually carried out in English.

The skill of speaking used in the discussion of medical cases with colleagues received a very positive response. A large majority of the respondents (88.2%) use English for that purpose. Only 11.8% of the sample "never" or "rarely" use English in discussing medical cases with colleague nurses.

Items 20 through 23 on the questionnaire investigate the use of the reading skill. In reading, the nurses use English most for reading patient file (95.4%) and reading medical reports (95.4%), then for reading instructions (90.2%), and last for reading professional references (86.2%).

The writing skill is used by the nurses for writing professional correspondence (item 24). More than half the sample (59.3%) stated that they "always" (16.4%) and "sometimes" (36.2%) use English for that purpose, while 35.5% "rarely" and 10.5% "never" do so.

### 3.6. Language Use off the Job

The last three items on the questionnaire treat the use of English off the job. Table VI below summarizes the subjects' responses to items 25, 26, and 27.

Table VI

Language Use Off the Job

	<u>Never</u>		<u>Rarely</u>		<u>Sometimes</u>		<u>Always</u>		<u>No Response</u>	
	N	%	N	%	N	%	N	%	N	%
25. Reading for pleasure	16	10.5	54	35.5	55	36.2	25	16.4	2	1.3
26. Following TV & radio programs	10	6.6	40	26.3	63	41.4	39	25.7		
27. Communicating with foreigners	9	5.9	26	17.1	54	35.5	63	41.4		

An examination of the responses in Table VI above demonstrates that the subjects of this study use English most for communication with foreigners. A large percentage of the nurses (76.9%) use English to communicate with foreigners. As for following TV and radio programs, 67.1% of the sample claimed that they "sometimes" (41.4%) and "always" (25.7%) use English for that purpose. The smallest percentage of the three (52.6%) use English off the job to read for pleasure.

## 4. CONCLUSION

In this research project, we have delineated the attitudes, motivation, evaluation of English language instruction, perception of abilities, and language use by a group of Jordanian nurses working in private and public hospitals . The results of the participants' responses clearly demonstrate that Jordanian nurses regard English as a very important tool for success on the professional level and as a prestige marker on the social level. They also feel that English language instruction at school was very beneficial for them in their profession as nurses. However, Jordanian nurses have exaggerated their abilities in English. The subjects claim that they use English on the job mainly to understand lectures, to understand instructions, to discuss medical cases, to read patient file, to read medical reports, to read references, and to write professional correspondence. On the other hand, they use English off the job to communicate with foreigners, to follow TV and radio programs, and to read for pleasure.

## References

- Harrison, W., C. Prator, and G.R. Tucker. English Language Policy Survey of Jordan: A Case Study in Language Planning. Arlington, VA: Center for Applied Linguistics, 1975.
- Sultan, Fathi Abdul Qader. Nursing in Jordan: Start, Development, and Aspirations. Amman, Jordan. 1997.
- Zughoul, M.R. and R. Hussein (1985). "English for Higher Education in the Arab World: A Case Study of Needs Analysis at Yarmouk University." The ESP Journal 4:2, pp. 133-52.
- Zughoul, M.R. and R. Hussein (1985). "The Language of Higher Education in Arab Universities: The Role of English in the Context of Arabicization". The Journal of the Arabic Language Academy of Jordan, 33, pp. 65-108.
- Zughoul, M.R. and M. El-Badarin (1988). "English for General Practitioners in Jordan: A Pilot Project in Teaching English for Medical and Para-medical Purposes." EMP. A publication of Kuwait University, 5:1, pp. 15-33.
- Zughoul, M.R. (1999). "The Language of Higher Education in the Arab World: Challenges, Conflicts and Accommodation." A paper presented at the Selmu Seminar Valetta, Malta.

## Appendix

### Questionnaire

#### A. Personal Data

Name \_\_\_\_\_ Years of Experience \_\_\_\_\_  
Sex \_\_\_\_\_ Qualification \_\_\_\_\_  
Age \_\_\_\_\_ Years of Experience \_\_\_\_\_  
Place of work \_\_\_\_\_

Please show the extent of your agreement/disagreement with each of the following statements by marking (X) where appropriate.

- B. 1. Knowledge of English is necessary for success in my profession as a nurse.  
2. Knowledge of English helps me improve my professional standards.  
3. Knowledge of English enables me to keep up with new developments in the field of nursing.  
4. I feel proud when I speak English and express my ideas fluently.  
5. I feel uncomfortable because I don't know English well.  
6. Knowledge of English is a marker of higher social standard.
- C. 7. Knowledge of English gives me better chances for getting a job in Jordan.  
8. Knowledge of English gives me better chances for further training abroad.  
9. Knowledge of English helps me update my medical knowledge.  
10. Knowledge of English helps me in my profession as a nurse, but it is not necessary.  
11. I am trying seriously to improve my English by formal study.
- D. 12. English language courses taken at school have helped me understand and use English in my nursing job.  
13. English language courses taken at school provided me with a general language knowledge.  
14. English language courses taken at school helped me read medical references.  
15. English language courses taken at school helped me with the written assignment in my job.
- E. 16. I can evaluate my proficiency in English in the four language skills as follows:

	Weak	Average	Good	Very
Good				
Listening				
Speaking				
Reading				
Writing				

- F. 17. I use English to listen to instructions.  
18. To understand medical lectures and symposia.  
19. Discuss medical cases with colleagues.  
20. Read instructions.  
21. Read medical reports.  
22. Read patient's file.

23. Read professional references.
24. Write professional correspondence.

Please continue. I use English off the job for the following purposes:

25. Reading for pleasure.
26. Following TV and radio programs.
27. Communicating with foreigners.



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